The majority of biomedical research that improves patients’ lives would not be possible without substantial funding from external sources. While the National Institutes of Health (NIH), primarily through the National Cancer Institute (NCI) and the National Institute of Diabetes and Digestive and Kidney Diseases, is the principal funder for most urological research, whether on urological cancers or other diseases considered more benign, there are many other funders, public as well as private, that are critical contributors to the funding landscape for urological research.

One of the greatest concerns in research funding has been the lack of increases for many years. In the context of inflation and the increasing costs of conducting research, flat research funding budgets translate to fewer grants being made and diminishing amounts of funding. This trend of flat or diminishing budgets has unfortunately been pervasive in many funding sources.

However, recent changes in funding available from the Congressionally Directed Medical Research Programs (CDMRP), a component of the Department of Defense that has been supporting research since 1992, are creating some high hopes for urological research. The CDMRP represents a collection of about 30 programs that exist exclusively to provide extramural funding for the research community. Funds for the CDMRP are added to the federal budget each year through strong bipartisan support in Congress, and spurred on by major forces of research advocacy from patients, scientists and physicians.

In the CDMRP 6 programs support urological research (see figure). These programs and their funding amounts include the Prostate Cancer Research Program (the second largest funder of prostate cancer research after the NIH at $80 million), Peer Reviewed Cancer Research Program (PRCRP, $50M), Peer Reviewed Medical Research Program ($275.7M), Spinal Cord Injury Research Program ($30M), Tuberous Sclerosis Complex Research Programs ($6M) and Multiple Sclerosis Research Program ($6M). These programs have supported some of the most impactful urological research in the last 2 decades.

Importantly, the funding available for these programs in the coming months includes some meaningful changes. Since 2010 the $50M PRCRP has included kidney cancer as one of its several fundable topic areas. However, in Fiscal Year 2016 (FY16), as a direct result of AUA research advocacy, for the first time CDMRP will begin accepting applications for bladder cancer research through the PRCRP.

Bladder cancer is one of the lowest funded diseases at the NCI relative to the years of life lost, but advocacy for bladder cancer research has been growing. For example, by developing collaborative networks of researchers and strong patient advocacy, the Bladder Cancer Advocacy Network has raised awareness about bladder cancer. Through the AUA’s efforts, the addition of bladder cancer research to the list of fundable opportunities supported by the CDMRP opens an untapped resource for bladder cancer researchers.

Collective and well organized efforts are required from the urology community to overcome discrepancies in the distribution of research funds—a mission that remains vital for the AUA Office of Research.


FROM THE Office of Research

Bladder Cancer Added to CDMRP

Fundable Opportunities

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POIN/Counterpoint

Robotic Laparoscopic Extravesical Ureteral Reimplantation: Pro

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Effective innovation involves risk taking, proper mitigation, and assessment. The IDEAL recommendations have been proposed as a model for effectively evaluating surgical innovation before mainstream adoption. This model describes the 5 steps of Idea, Development, Exploration, Assessment and Long-term study that are required for safe and effective surgical innovation.

Endoscopic techniques have been mostly unsuccessful. A laparoscopic approach was first described in 1994 but has not been widely accepted due to technical challenges. Robotic assisted laparoscopic extravesical ureteral reimplantation (RALUR-EV) has been well described but has resulted in poor outcomes, especially with respect to reflux resolution and ureteral complications. Of course, these data would suggest that perhaps RALUR-EV should not be performed out of concern for the best interest of our patients. So why should we invest in such surgical innovation? And if we do, how can we avoid such poor outcomes?

Minimally invasive surgery (MIS) has been adopted across the majority of surgical fields due to the numerous intuitive benefits. Decreased length of hospital stay, faster convalescence, decreased pain and improved cosmesis have been proposed as potential benefits of MIS.

Children recovering from RALUR-EV have a lower narcotic requirement compared to those recovering from an open procedure. Similarly Smith et al demonstrated that children who underwent RALUR-EV had a shorter hospital stay and lower narcotic requirement than those treated with open ureteral reimplantation. One must consider the benefits of a shorter hospital stay for the patient, who returns more quickly to the familiar home environment, and for the parents, who spend less time
away from other children or work.

Finally, it has been demonstrated that several small incisions are associated with less skin tension, pain and scarring compared to a single larger incision of equivalent total length.5 This suggests that even if open reimplantation can be performed through a relatively small incision, there is less morbidity associated with performing the same procedure through several smaller incisions such as those needed for 3 to 4 laparoscopic trocars.

Such evidence is the foundation for ongoing efforts to adopt RALUR-EV. The question that remains, then, is how can we continue to refine technique so that the results are optimized, reproducible and widely adopted for the benefit of our patients? Until this question is addressed the application of this procedure should remain limited.

With the IDEAL model the development and exploration of a novel technique are crucial. So far the literature does not provide an adequate description of the detailed technique needed to complete this procedure. At our institution we have worked for the last 8 years to modify the technique and improve reflux resolution rates from 66% to 90% among children with high grade preoperative vesicoureteral reflux (VUR). Specific modifications including increased detrusor tunnel length (L), use of a U stitch at the ureterovesical junction (U), inclusion of adventitia in detrusorrhaphy (A) and use of an apical alignment stitch (A) have been critical to our increased success (LUAA technique).6 Several key steps in the procedure are illustrated in figures 1 through 3.

Assessment is the next necessary step in adopting a new technique. Select centers have been performing RALUR-EV and the literature describes an overall complication rate of 2% to 10%.7 While these are individual author series, we recently assembled a multi-institutional group called the robotic vs open ureteral reimplantation (RoVOUR) study group, consisting of pediatric urologists at 9 institutions nationwide.

In the largest cohort of patients studied to date we assessed complications and outcomes among 371 cases of ureters treated with RALUR-EV for primary VUR. Preliminary analysis showed an overall complication rate of 11.4% and a radiographic resolution rate of 86.7%. Clavien grade 3 complications occurred in 7 cases (2.6%) and there were no grade 4 or 5 complications.8

Transient urinary retention has long been a concern with the open approach. The retention rate was 2.6% in this series and 1.7% in our institutional series, possibly due to better delineation and preservation of the equivalent safety profile, and encourage others to adopt our refined surgical technique to optimize results and support ongoing inquiry and thoughtful consideration of the outcomes of RALUR-EV.

Pediatric Robotic Ureteral Reimplantation: Con

There is an increasing trend in the United States in which hospitals, insurance providers and consumers are demanding high value health care. Simply put, high value health care can be defined as high quality health care with low costs. For a newer technology or technique to achieve widespread acceptance, it should offer higher value (higher quality and/or lower cost) than the current standard.

Although the first recorded attempt of ureteral reimplantation was in 1876, Cohen’s 1975 report of the cross-trigonal technique set the standard for what is commonly practiced in 2016. The initial results of 99% success and 1% complications have

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**Figure 1.** Ureteral dissection in female (A) and male patient (B). Reprinted with permission.6

**Figure 2.** Highlighting length (U) of detrusor tunnel, placement of U stitch and use of apical (A) alignment stitch. Reprinted with permission.6

**Figure 3.** Placement of running detrusorrhaphy suture, with inclusion of ureteral adventitia. Reprinted with permission.8

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reimplantation in children. Although a single 2012 case series reported a 99% success rate with 0% complications,10 these results have not been replicated. Although the success rates of eliminating vesicoureteral reflux have been reported in the range of 66% to 100%, the majority of published series report success rates of 77% to 90%, inferior to those of the open standard.2

Complication rates of up to 10% to 27% have been reported in multiple robotic series, and have included urinary leaks, ureteral injury, ureteral obstruction and postoperative ileus.3 Severe complications of this nature are highly unusual with open ureteral reimplantation. Although some have suggested that this is solely due to inexperienced surgeons, 2 recent large separate database reviews have revealed that across the United States the robotic approach is associated with a significantly higher rate of postoperative complications and secondary procedures compared to the open approach.9, 11

Virtually every comparison of open and robotic ureteral reimplantation has noted that the robotic procedure takes significantly longer, sometimes more than twice the length of time of an open ureteral reimplantation. There is a growing body of evidence of the neurotoxic effects of anesthesia on the developing brain and the potential association with long-term learning disabilities in children.12

One would hope that the robotic approach would have a clear and significant benefit over the open approach to justify this potential additional risk.

Reported benefits of the robotic approach over the open procedure have been questionable. Two series reported a statistically significant reduced opioid requirement with robotic vs open techniques, but in both series the difference was only the equivalent of 1 dose.3, 13 Harel et al reported no significant difference in postoperative pain scores, which the authors admitted was a more accurate assessment of pain in children.3

A PHIS (Pediatric Health Information System) database review of 6,090 robotic and open ureteral reimplantation procedures revealed that postoperative opioid use was lower in the robotic cases in the first 48 hours, but those children were significantly more likely to receive ketorolac.3 It unknown if the robotic approach is associated with less postoperative pain independent of ketorolac administration.

Another reported benefit of the robotic approach is a reduction in length of stay. However, it is difficult to improve on the length of stay of the open approach where many children only spend 1 night in the hospital. A recent review of the PHIS database did reveal that the robotic approach was associated with a statistically significant reduction in length of stay compared to the open approach.9 However, the mean reduction in length of stay was only 7 hours.

Although some have suggested that the robotic approach can be cost equivalent to the open approach, 2 recent large national database reviews have clearly shown this not to be the case. Even without considering the substantial capital expense of purchasing the robot, robotic ureteral reimplantation costs 40% to 60% more than open ureteral reimplantation.9, 11

Advocates of robotic technology frequently state that the robot is the future of pediatric urology. The future of pediatric urology is the same as the future of all of medicine: the drive to deliver high value, high quality, low cost health care. Compared to a previous standard, pediatric robotic ureteral reimplantation offers lower success, higher complication rates, higher costs, longer operative times with more exposure to potentially neurotoxic anesthesia, and no clinically significant benefit to length of stay and postoperative pain. This technique is not the future of pediatric urology. In our new age of high value health care, unless the operation can be improved, a technique with these results will be left in the past. ◆